Abstract Of The Disclosure

A plasma enhanced chemical vapor deposition apparatus and a method of forming a nitride layer using the same, wherein the plasma enhanced CVD apparatus includes a process chamber including an upper chamber with a dome shape, a lower chamber, and an insulator therebetween, a gas distributing ring, a susceptor for supporting a wafer and heating the process chamber, a plasma compensation ring surrounding the susceptor, a vacuum pump and an electric power source connected to the process chamber. The gas distributing ring has a plurality of upwardly inclined nozzles, allowing upward distribution of reactive gases. The method of forming a nitride layer includes forming a protective film on inner walls of a process chamber, the protective film having at least two layers of differeing dielectric constant, and sequentially supplying reactive gases to the process chamber. A nitride layer formed thereby has low hydrogen content, good density and oxidation resistance.